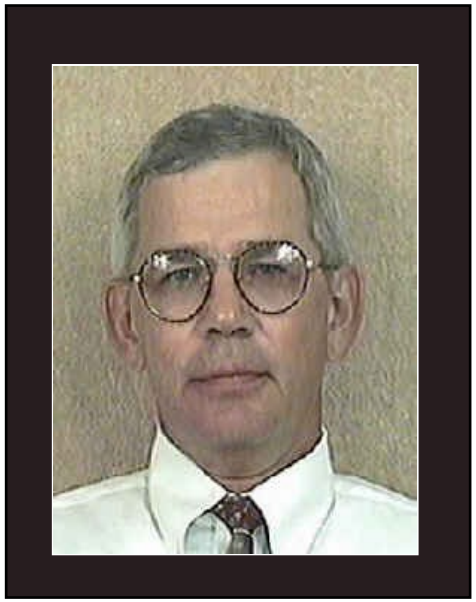
Biography



Mr. Larry Fillian

C4ISR SCIENCE AND TECHNOLOGY

C4ISR SCIENCE AND TECHNOLOG

- *SUPPORTING TODAY'S WARFIGHTERS*
- *SUPPORTING TOMORROW'S TRANSFORM*

Research, Development and Engineering Center
Contract Opportunities

Mr. Robert Doto
Director, CERDEC
Robert.Doto@us.army.mil 732 427 3967

Mission & Vision

CERDEC Mission

To develop and integrate Command, Control, Communications, Computers, Intelligence, Surveillance Reconnaissance (C4ISR) Technologies that enable Information Dominance for the warfighter

CERDEC Vision

To be the DoD leader in C4ISR solutions

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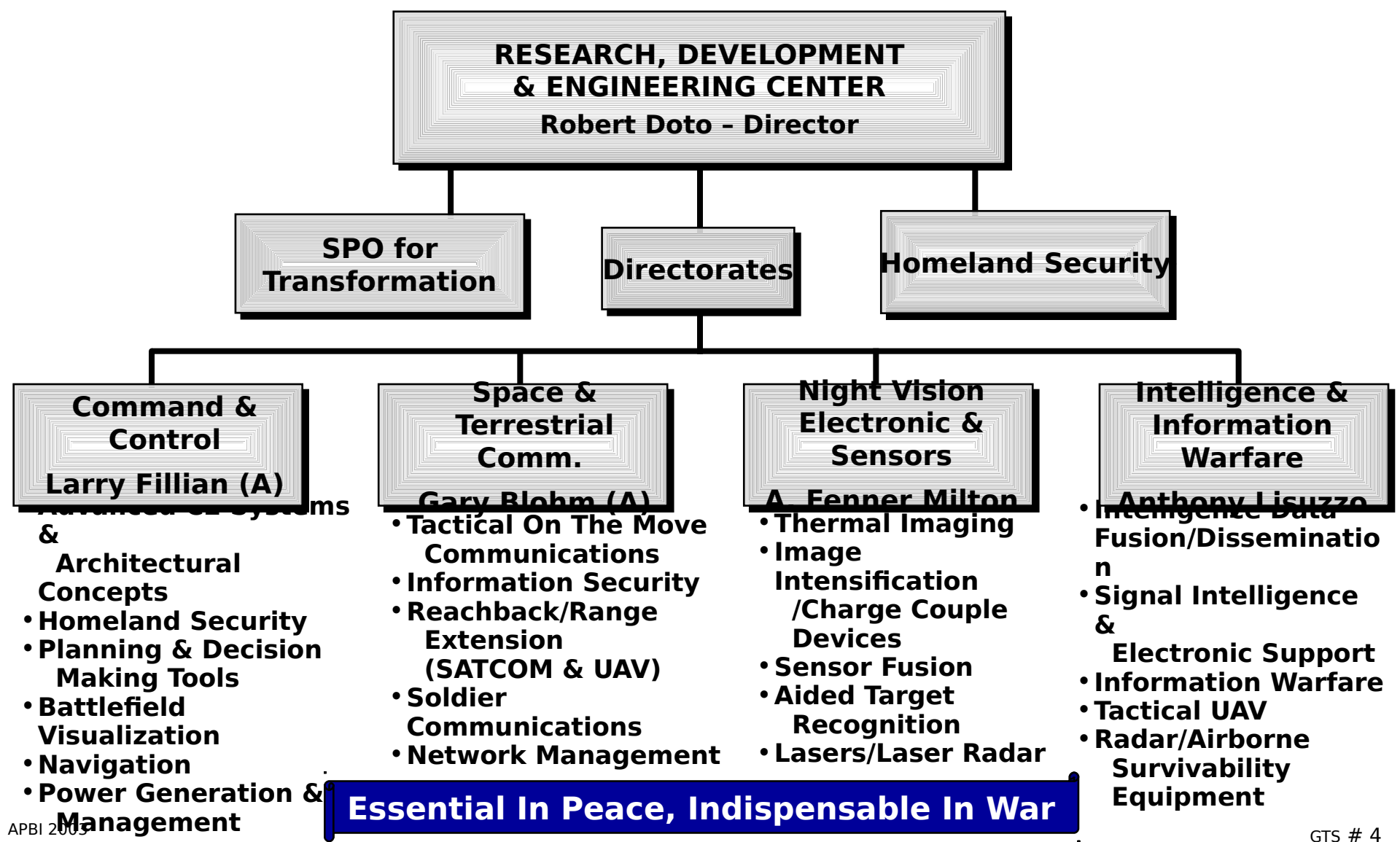
Organization/Mission



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C4ISR TECHNOLOGIES

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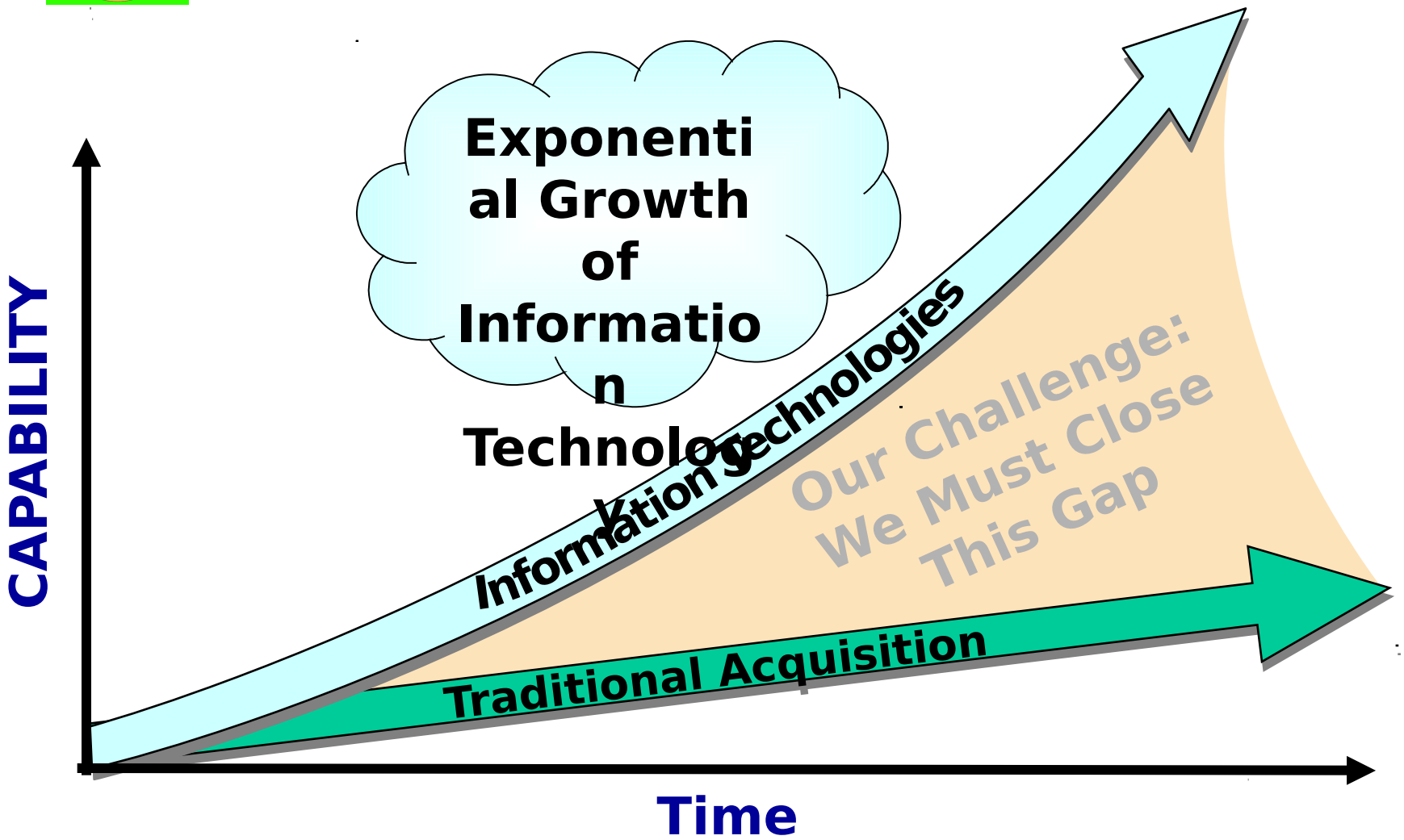
Impact of Information Technology



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Gap Closing Philosophy

Adopt Commercial off the shelf Technology / Products

Adapt Commercial Technology / Products When It Cannot Be Directly Inserted

Develop Technology in Concert With Other Services and Agencies for Unique Areas Promoting Partnerships, Alliances, Teaming

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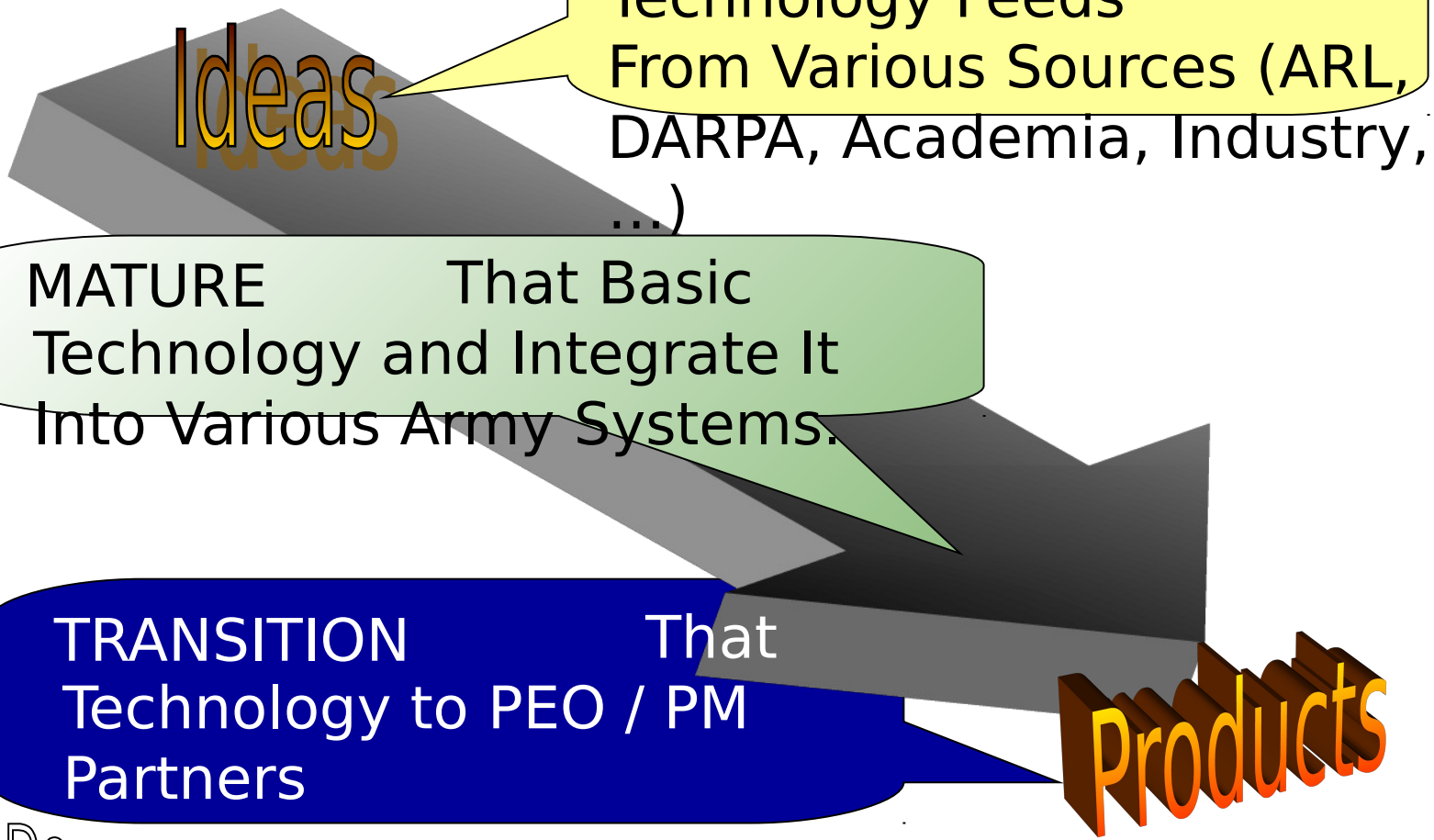
Mission Process



OBTAIN Basic Technology Feeds From Various Sources (ARL, DARPA, Academia, Industry, ...)

MATURE That Basic Technology and Integrate It Into Various Army Systems.

TRANSITION That Technology to PEO / PM Partners

What We Do

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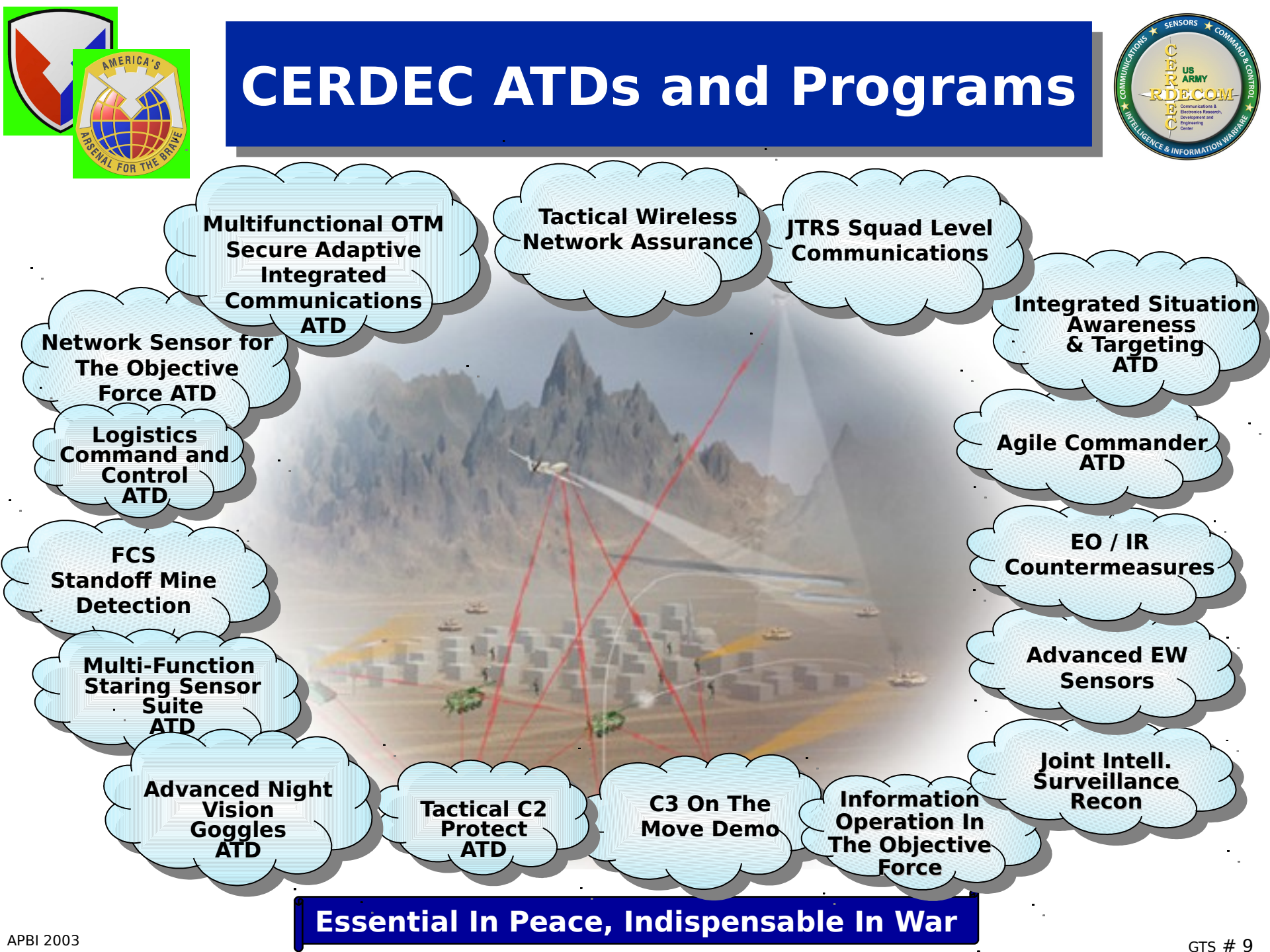
CERDEC ATDs and Programs


Multifunctional OTM Secure Adaptive Integrated Communications ATD
Tactical Wireless Network Assurance
JTRS Squad Level Communications
Integrated Situation Awareness & Targeting ATD
Network Sensor for The Objective Force ATD
Logistics Command and Control ATD
Agile Commander ATD
FCS Standoff Mine Detection
EO / IR Countermeasures
Multi-Function Staring Sensor Suite ATD
Advanced EW Sensors
Advanced Night Vision Goggles ATD
Tactical C2 Protect ATD
C3 On The Move Demo
Information Operation In The Objective Force
Joint Intell. Surveillance Recon

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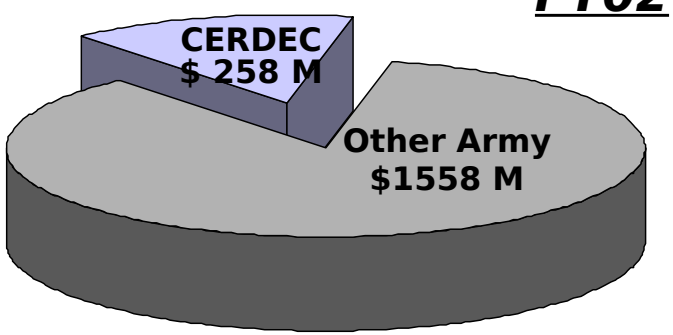
RDEC
Tech Base Funding

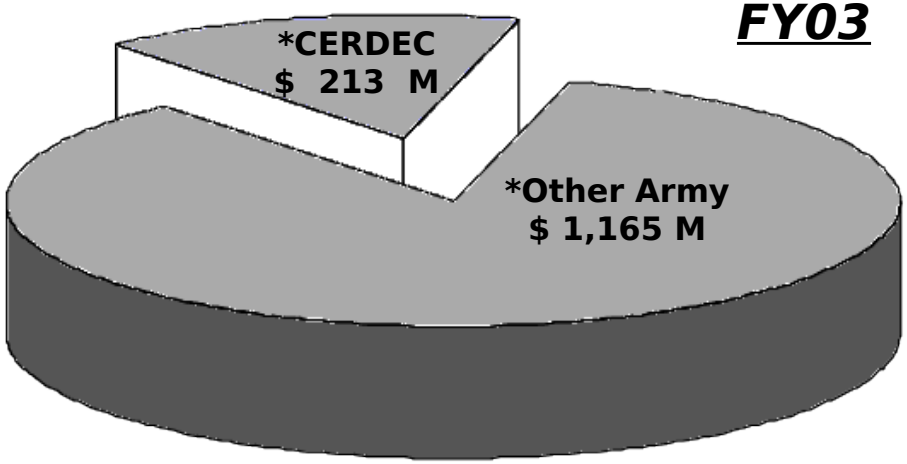
- **C4ISR is beginning to be acknowledged as the key FCS/OBJ Force enabler**
- **In FY02, it was only 14.2% of the Army 6.2 & 6.3 Tech Base Funding; in FY03, it's up to 15.5%**

FY02



Total Army
6.2 & 6.3 = $1,816M

FY03



****Total Army***
6.2 & 6.3 = $ 1,378 M
*Does not include anticipated Cong Plus Ups (CERDEC = $97.75M)

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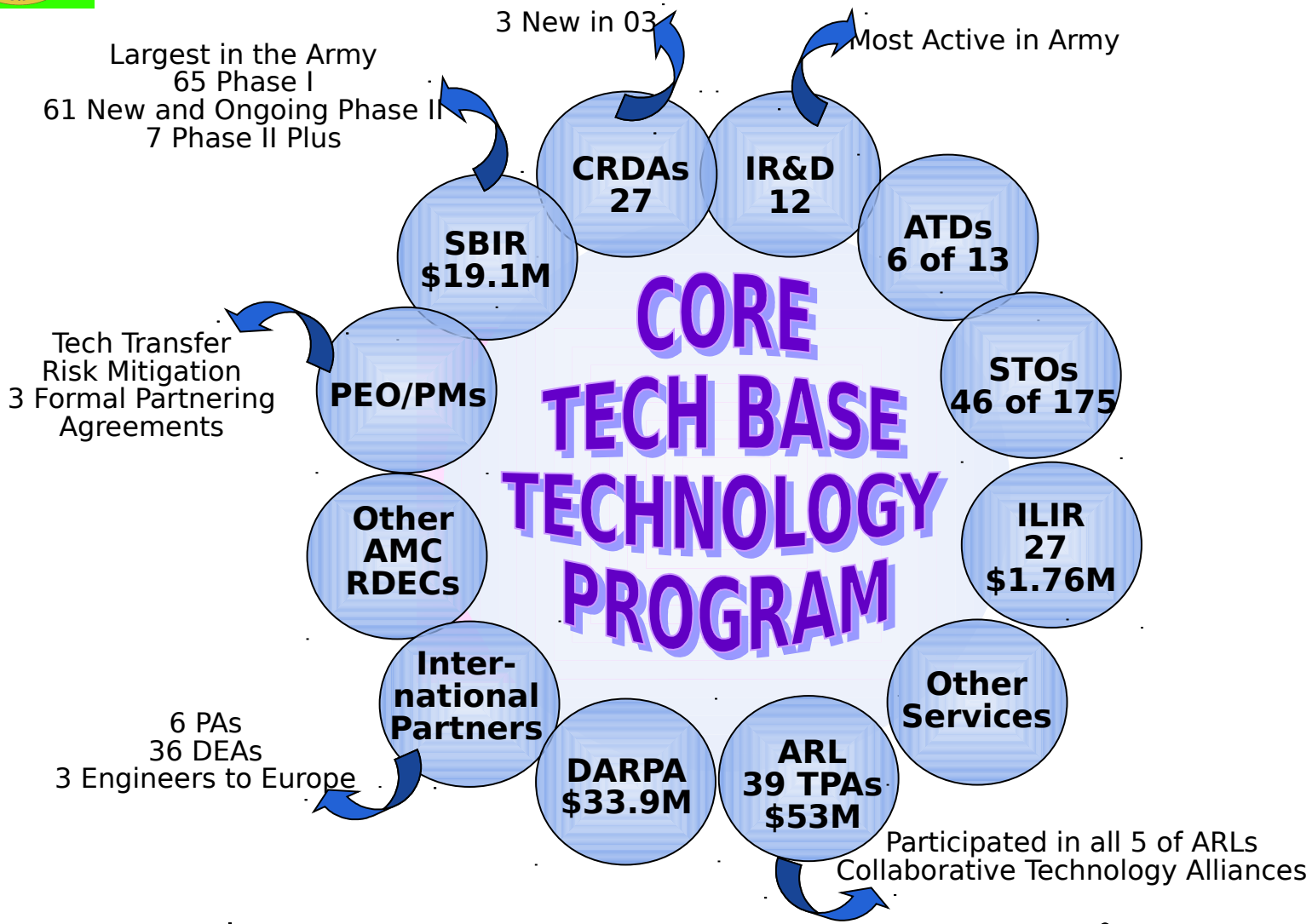
Technology Leveraging



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CERDEC Partnering with IT Industry and Academia

- **Mission Programs**
  - **Cost Share**
  - **Dual Use**
- **University Alliances**
- **Cooperative R&D Agreement (CRDA)**
- **Collaborative Technical Alliances**
- **Incubation Center**
- **International Exchange/Project Agreements**
- **Technology Exchange Conferences**
- **Venture Capital Structures**

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HOMELAND SECURITY (HLS)

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The Problem from our Perspective

- **A significant part of the Homeland Security problem revolves around the development of a scalable or tailorable architecture based on:**
  - **Communications**
  - **Command / Control**
  - **Sensors**
- **Sustainment**
- **Training**
- **Acquisition Management`**

These are our Core Business Areas for DoD

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DoD and HLS

- **DoD has a great deal to offer in protecting and defending the Homeland**
  - **State-of-the-art technology**
  - **Life Cycle management knowledge**
  - **Emergency response teams (e.g. Chem/Bio)**
- **HLS offers DoD**
  - **Urban Counter Terrorism Technology Test Bed**
  - **Force protection leveraging**
  - **Economies of scale**
  - **NRE investment saving**

We must
Protect the military
technology advantage

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Supporting Homeland Security

- **Focus on a three pronged process**
  - **Dual Use Products**
    - **Focus is First Responders**
    - **High volume/Economies of Scale**
  - **Limited Use Products**
    - **Focus is follow-on responders**
    - **Restricted Military products**
    - **DoD retains ownership; Responders operate/train**
  - **Classified Products**
    - **Focus is assistance to responders**
    - **DoD owns, operates, and controls**
    - **Responders receive information**

Protecting Our Military Technological Advantage

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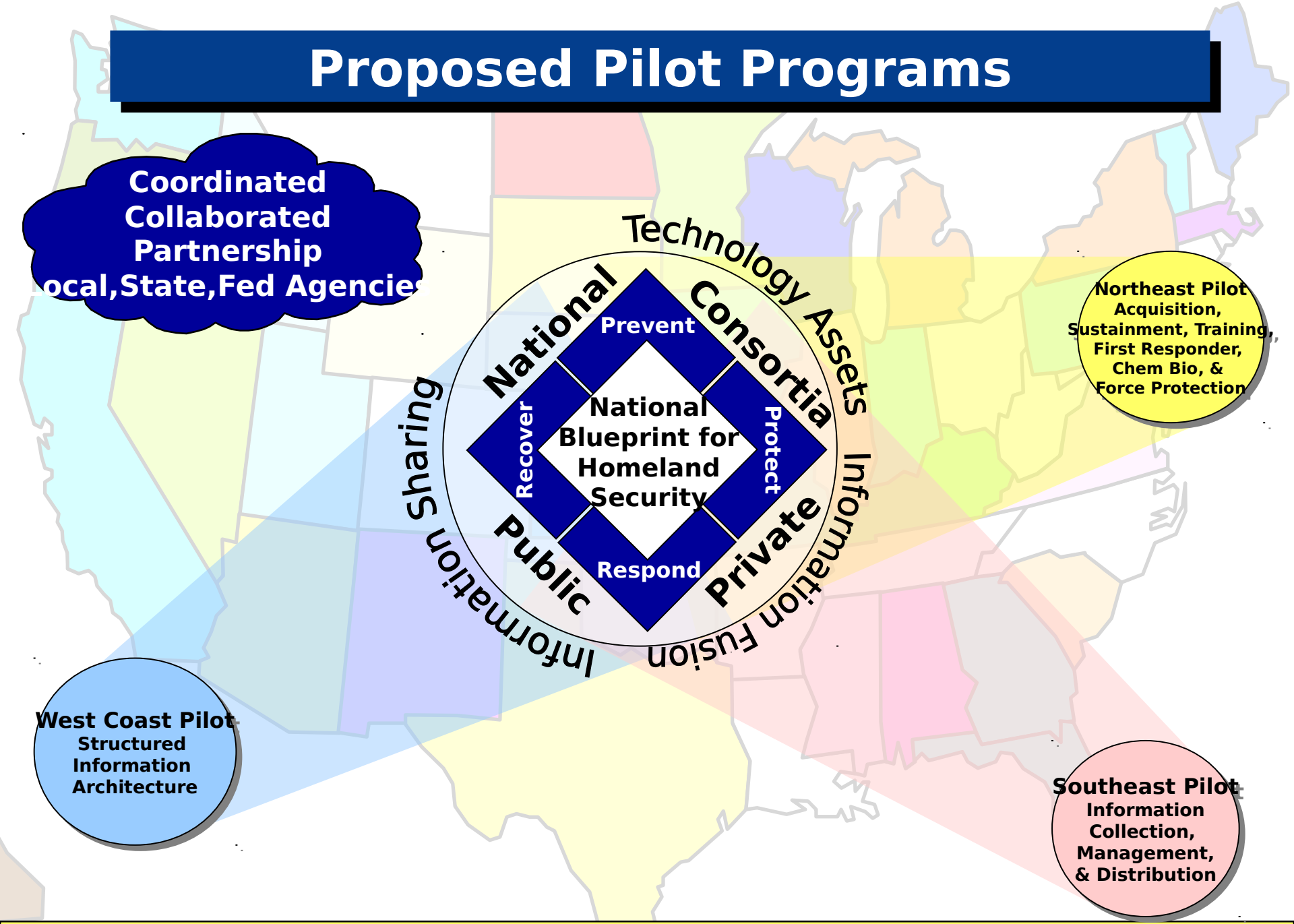
The Intent of the Office of Homeland Security

“To take *all* the technology assets that we have in Government and elsewhere and use them in such a way, *fuse* the information in such a way, *share the information* in such a way that we can hopefully prevent future terrorist attacks”

Secretary Ridge

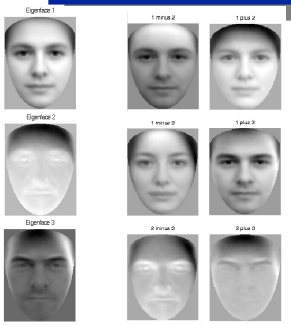
We have not lost our focus from these principles!

Proposed Pilot Programs



ney Does Not Equal Success – Focused Investment Do

Prevention Technologies



Facial Recognition

- Biometrics
- Networked Sensors
- Information Fusion
- Command Operations
- Collaboration

Port Security

Critical Facility Protection

Infrastructure Security

Transportation Security

Identification

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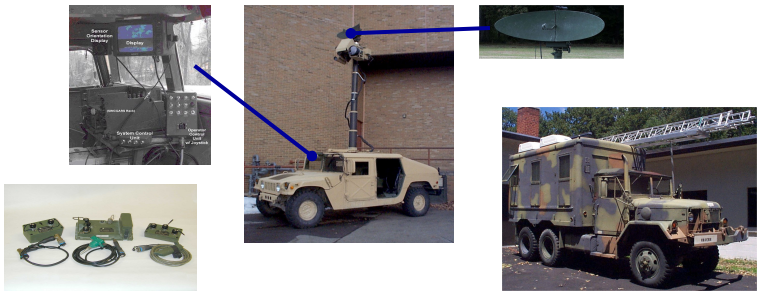
Protection Technologies

Night Vision

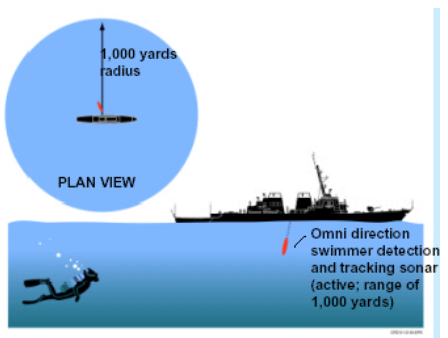
- Detection Sensors
- Information Fusion & Security
- Improved Sit[illegible] Aw[illegible]



Mobile Automated Monitoring

Chem/Bio

Critical Facility Protection



Swimmer Detection

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Response Technologies

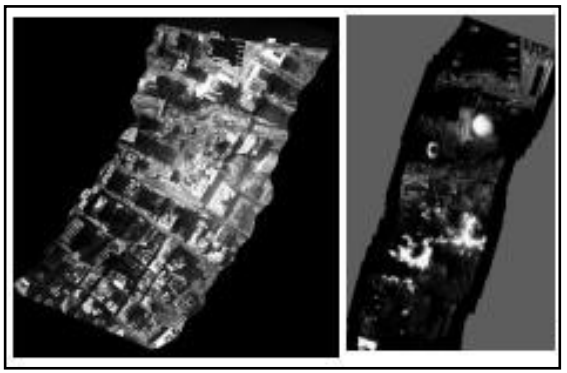
Digital Ensemble

- Command Posts
- Communications/ Wireless/Gateways
- Situational Awareness
- Interoperability

FLIR on Robotic Vehicle

Electronic Listening Devices

Command Operations Center



Hyperspectral Fly Over

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Recovery Technologies

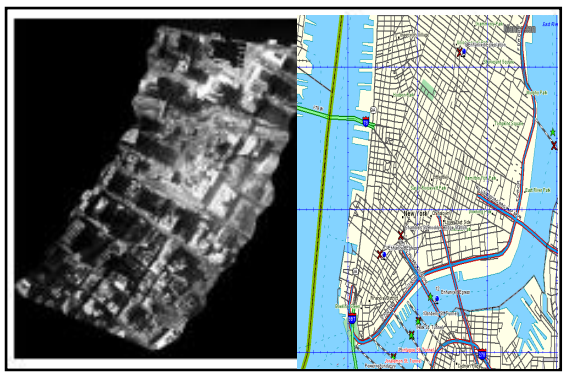
Access Control

Telecom Reconstitution

NESC/Sustainment

Civil Support Team

- Control of Incident Site
- Accountability
- Information Flow
- Follow on Sustainment



Geo-Registration

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Summary

- **9/11 Proved that CECOM has essential C4ISR technologies**
- **We have identified areas that can be significantly leveraged**
- **We are working with appropriate activities to solidify the vision**

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HLS Contract Opportunities

It's potentially HUGE…

…we're still working on it!

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SMALL BUSINESS INNOVATION RESEARCH (SBIR)

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Small Business Innovation Research

***FY04 Program* - 50 Topics**

website:

http://www.acq.osd.mil/sadbu/sbir

Microelectronics & Photonics

Sensors & Information Processing

High Performance Computing & Simulation

Power & Directed Energy

Phase I

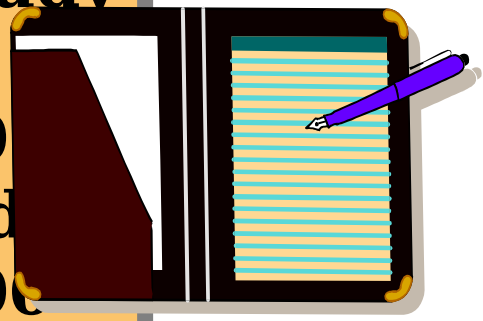
Feasibility Study

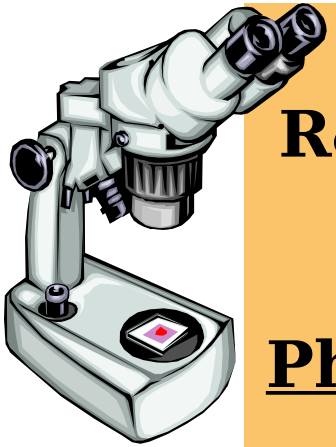
6 Months

NTE $70,00

Option Fund

NTE $50,00





Phase II

R&D 2 Years

NTE

$730,000

Phase II Plus

1 Year -

$250,000

Matching

Phase III

Commercialization

Funding from

Non-SBIR Source

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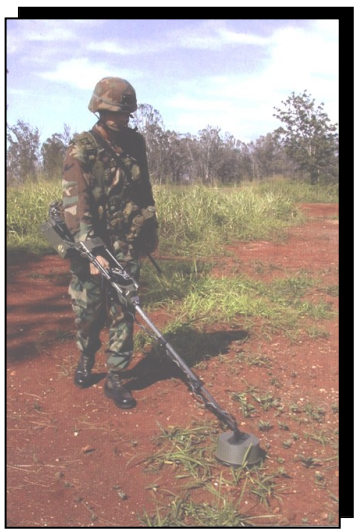
Small Business Innovation Research FY2003 Program

- **50 Topics published in the DoD 02.2 Program Solicitation**
- **602 Phase I Proposals were submitted against topics**
- **65 Phase I Proposals were selected for award**
  - **11% of all proposals submitted**
- **32 Phase II Proposals were awarded this year**
  - **70% of all Phase I proposals awarded**
- **Since inception in 1995, CERDEC has won 7 annual Phase II Quality Awards**

Phase III Success Story

Non-Metallic Landmine Detection Software
Scientific Systems Company, Inc.



Impact:

- **$663,00 in Government/DoD R&D funding**
- **Product is currently being evaluated by CERDEC and Cyterra for further development**

- Developed an Automated Mine Detection software tool to allow operators to positively identify landmines
- Uses sophisticated object recognition techniques to automatically isolate anomalous objects
- Ability to adapt itself to diverse environments & conditions
- Hardware upgrades accomplished independent of tool

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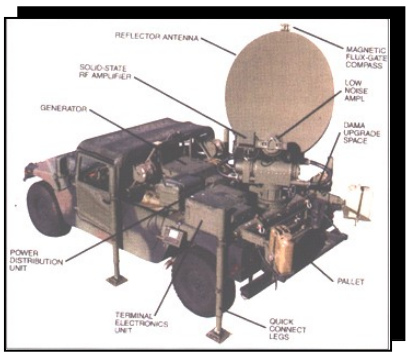
Phase III Success Story

Error Correction for Satellite Communications
Xenotran LLC



Impact:

- **2 units sold to date, generating over $78,000 in sales**
- **Received subcontract from Raytheon for development of the SMART-T satellite equipment for the Army**
- **Received $373,659 from Raytheon to develop its Turbo Coder Technology**
- **The US Army has committed to use Xenotran turbo coder in future Advanced Extremely High Frequency satellite communications equipment**

- Uses a technique commonly referred to as “turbo coding”
- Xenotran implementation is the closest to the Shannon limit for a
  coded signal
- Turbo coder will allow twice as much information to be sent over a
  communication channel compared with the earlier coding

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Small Business Innovation Research (SBIR) Program Opportunities

- **OBJECTIVE:** To stimulate technological innovation, strengthen role of small business in DoD R&D needs, foster & encourage participation by minority/disadvantaged persons, increase commercial application of DoD supported research in R&D results.
- **CONTRACT TYPE:** Firm Fixed Price (FFP)
- **ESTIMATED VALUE:** $5.3M
- **KEY MILESTONES:** (Phase I)

Pre-Solicitation	**1 May 2003**
Solicitation Opens	**1 July 2003**
Solicitation Closes	**14 August 2003**
Contract Award	**13 December 2003**

- **PROGRAM CONTACT:** Suzanne Weeks, (732) 427-3275
- **ACQUISITION CONTACT:** Robert Calaway (732) 532-5562

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CONTRACT OPPORTUNITIES

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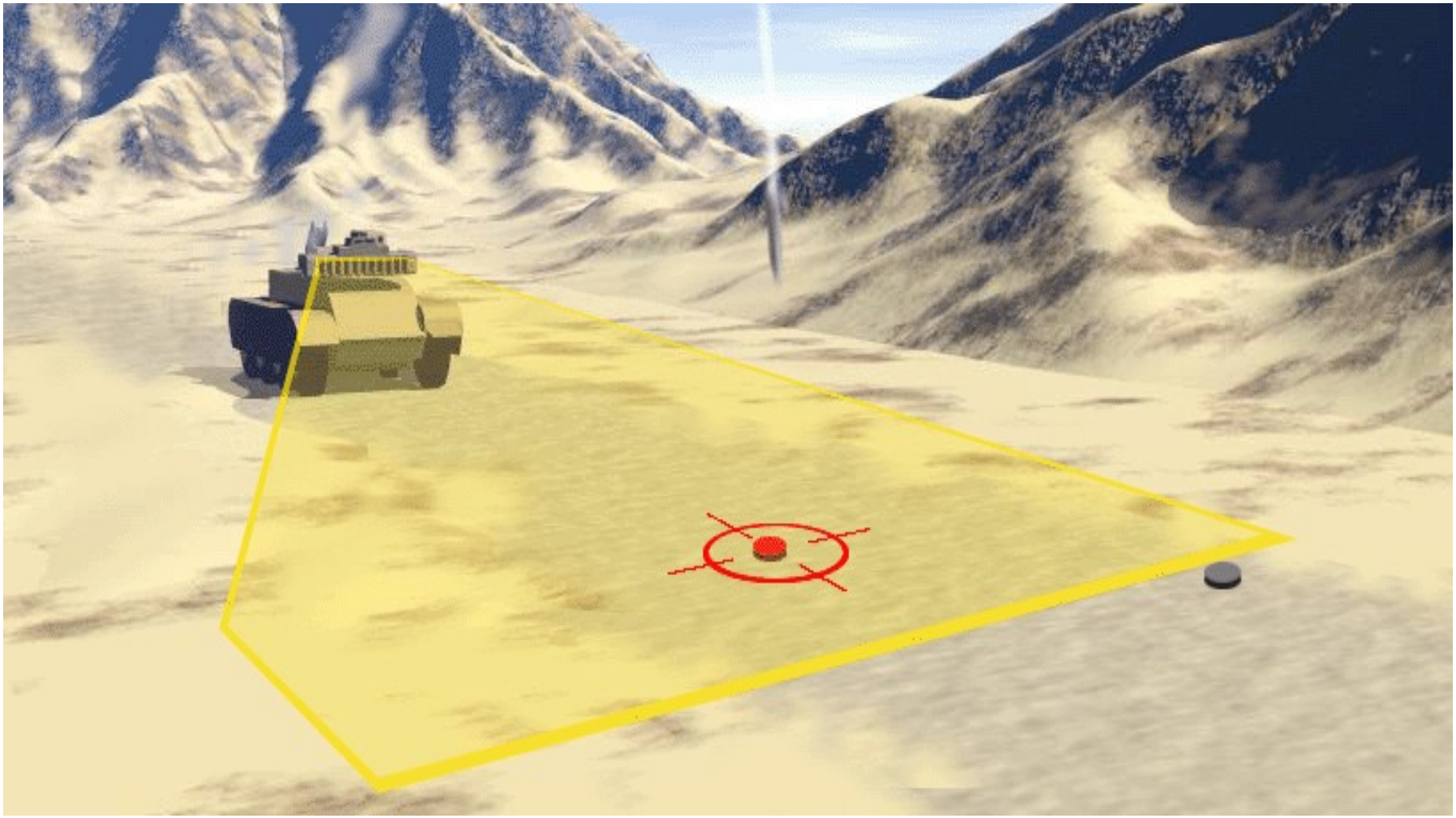
Precision Mine Neutralization



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Precision Mine Neutralization

DEFINITION

Sensor technologies investigated under this effort will enhance the operational tempo of the Objective Force's mounted operations in maneuver areas that have a high likelihood of surface and buried antitank mines, side-attack weapons, or booby traps.

Precision Mine Neutralization

CHARACTERISTICS

- Acoustic sensors for stand-off confirmation of previously detected on-route and side-attack threats
- Forward-looking sensors for stand-off detection of the leading edge of mined areas while traveling cross-country
- On-the-move precision neutralization munitions for on-route and cross-country threats in the Unit of Action.

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Precision Mine Neutralization

STATUS/PROGRAM DIRECTION

- FY04 new start
- Coordinating transition of technologies from 6.2 to 6.3 technical development with relevant organizations
- Technology transition scheduled to occur in FY07

Precision Mine Neutralization

CHALLENGES

- High clutter and FAR prevent precision, confirmed standoff detection and point neutralization at speeds greater than 2 kph; cannot meet FCS requirements for OPTEMPO and leading edge detection of minefields
- No effort to develop & embed precision mine detection and neutralization technologies on single platform for cross country scenarios

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Precision Mine Neutralization

- **OBJECTIVE:**
  - Increased FCS platform assured mobility and survivability
  - Revolutionary increase in ability for integrated precision detect, confirmation, and avoidance
  - Point neutralization of mines embedded on FCS manned mounted platform in all environments (i.e. cross country)
- **CONTRACT TYPE:** Cost Plus Fixed Fee (CPFF)
- **ESTIMATED VALUE:** $3-4M
- **KEY MILESTONES:**
  - Fedbizopps Announcement: Summer FY03
  - Late Nov'03-Dec'03: Briefing on program objectives to prospective bidders
  - Request for proposal in January FY04
  - Mid-FY04 award contract
- **TECHNICAL CONTACT:** Mr. Charles Amazeen (703) 704-1092
- **ACQUISITION CONTACT:** Ms. Susan McDowell (703) 704-1252
- **SOLICITATION # or RFQ #:** TBD

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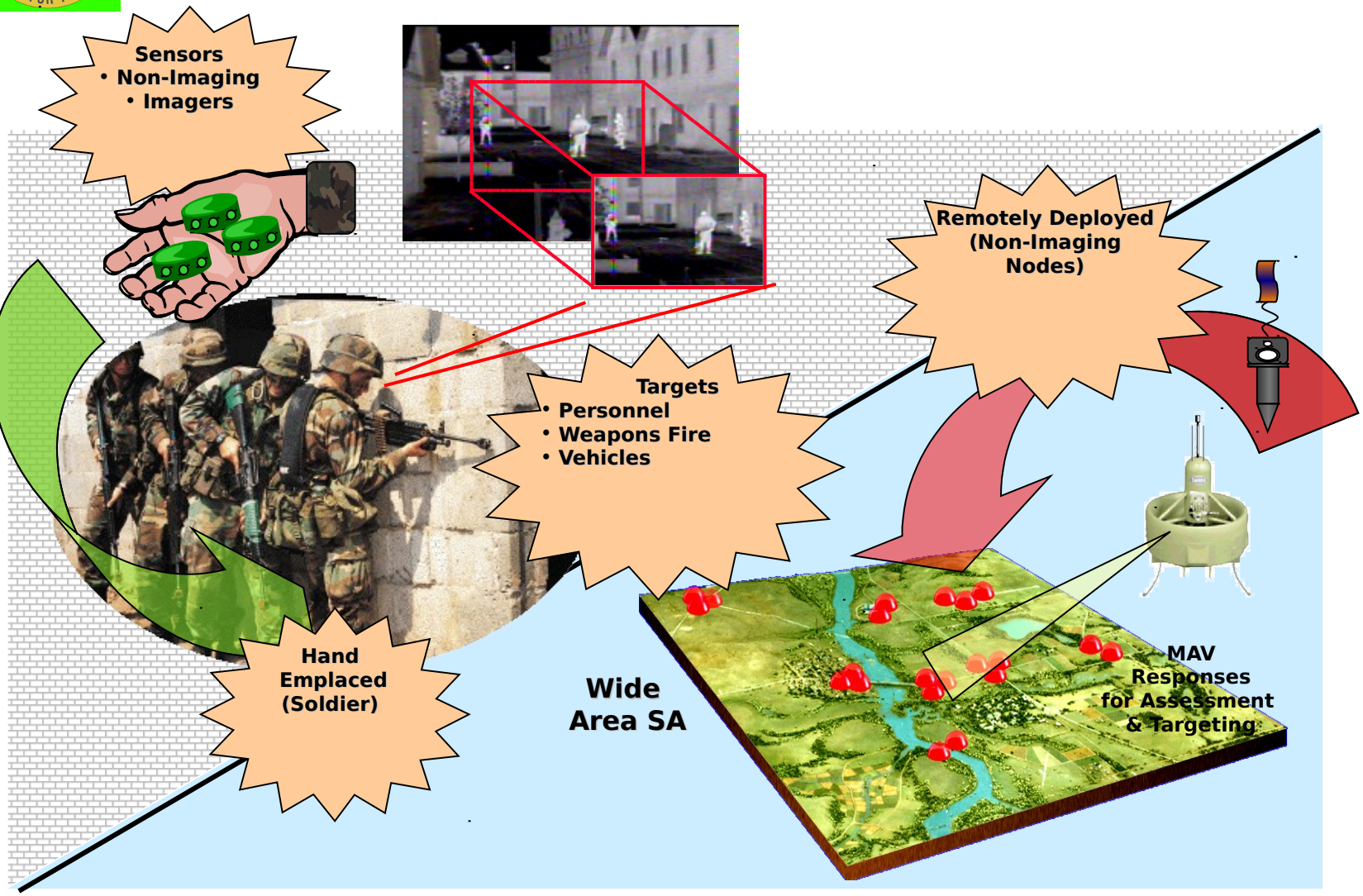
Disposable Sensors



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Disposable Sensors

DEFINITION

The Disposable Sensors effort will mature and demonstrate a family of small, lightweight, low power, very low cost, and expendable unattended imaging and non-imaging sensor nodes in support of FCS and Land Warrior/OFW requirements.

Disposable Sensors

CHARACTERISTICS

Disposable Sensors will be based on enhanced technology in the following areas:

- Very low cost sensing & signal processing
- Very low cost, very low power information exfiltration & communications
- Accurate location of sensor nodes
- Information management & exploitation
- Highly integrated design leveraging commercial products & processes

Disposable Sensors

STATUS/PROGRAM DIRECTION

—

FY04 New STO; Combined ARL/NVESD effort

Disposable Sensors

CHALLENGES

Developing truly innovative technology to achieve sensor cost goals - $5 - $10/unit (non-imaging nodes), $50 - $100/unit (imaging nodes)

Disposable Sensors

- **OBJECTIVE:** Provide the Objective Force with enhanced situational awareness and survivability in urban/complex and wide area terrain through deployment of a family of very low cost, small, lightweight, low power, unattended imaging and non-imaging ground sensors
- **CONTRACT TYPE:** BAA in FY04; Competitive Acquisition in FY06
- **ESTIMATED VALUE:** BAA: FY04 - $5-6M; CPFF: FY06: $25-30M
- **KEY MILESTONES:**
  - **FY04** Program Kick-off/BAA
  - **FY05** Proof of Principle Demo of Urban Sensors during Night Vision Cave & Urban Assault ACTD Demo II
  - **FY06** RFP, Block I delivery (ACTD Residuals)
  - **FY07** Block II delivery
  - **FY08** Block III delivery
  - **FY09** Transition to PEO Soldier
- **TECHNICAL CONTACT:** Mr. Mike Jennings (703) 704-1032
- **ACQUISITION CONTACT:** Ms. Susan McDowell (703) 704-1252
- **SOLICITATION # or RFQ #:** TBD

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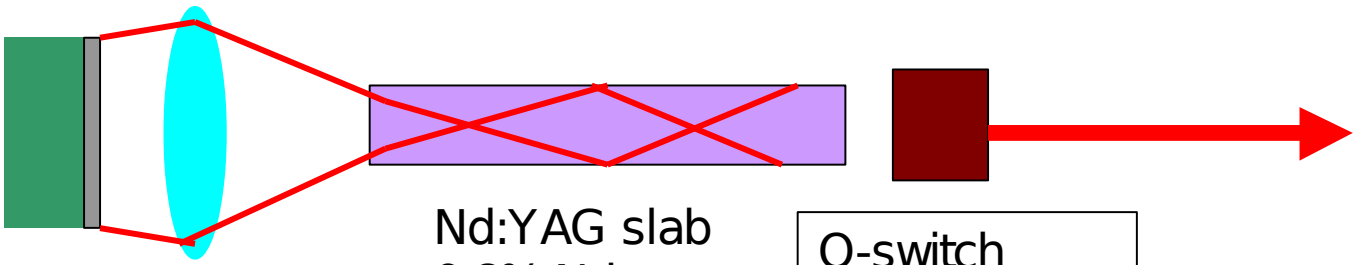
Lightweight Laser Designator

Laser Diode End-pumped Laser



Laser Diode Array
12 bars, 1200 watts
300 mJ pump energy

Nd:YAG slab
0.8% Nd
5x5x40 mm

Q-switch
EO or passive

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Lightweight Laser Designator

DEFINITION

Lightweight, compact lasers are required for laser designator systems. Lightweight Laser Designators will proliferate the future battlespace and are critical for FCS Precision Targeting systems across many platforms. The major goal is to develop a laser system that meets designator requirements in a 4 pound package

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Lightweight Laser Designator

CHARACTERISTICS

- High brightness laser diode arrays
- New solid state laser designs
- State-of-the-art electronics
- Alternative host materials

Lightweight Laser Designator

STATUS/PROGRAM DIRECTION

- FY04 proposed/new start
- Coordinating transition of technologies from 6.2 to 6.3 technical development with relevant organizations
- Technology transition scheduled to occur in FY07 (TRL 6)

Lightweight Laser Designator

CHALLENGES

- Laser designator systems are too heavy for Army tactical FCS UAVs and OF soldier applications
- Diode pumped lasers efficient, but do not work over wide temperature range without temperature control
- Batteries required to power current LD systems are heavy
- Mechanical stabilization of LD systems are large and heavy

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Lightweight Laser Designator

- **OBJECTIVE:** Develop a laser system that meets designator requirements in a 4 pound package
- **CONTRACT TYPE:** Time and Material (T&M)
- **ESTIMATED VALUE:** $3-4M
- **KEY MILESTONES:**
  - Briefing on program objectives to prospective vendors: 1QFY04
  - Award contract: 2QFY04
- **TECHNICAL CONTACT:** Mr. John Nettleton (703) 704-1704
- **ACQUISITION CONTACT:** Ms. Shirley Matthews (703) 704-1225
- **CONTRACT #:** DAAB07-01-D-GG02

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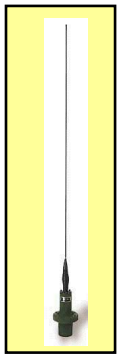
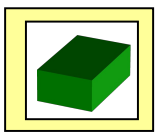
Advanced Antennas STO
30-450 MHz Band Switched Antenna

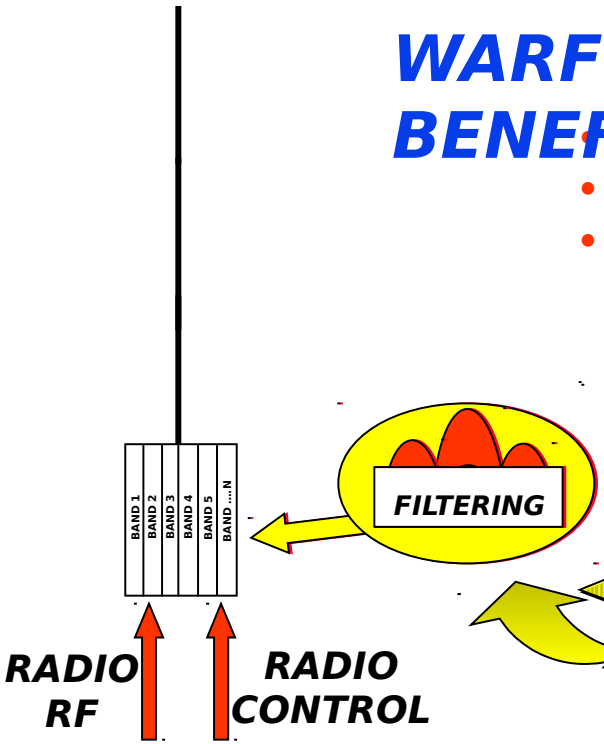
WARFIGHTER BENEFITS:

- GREATER RANGE
- REDUCED COSITE
- UNIT COST < $2.1 K

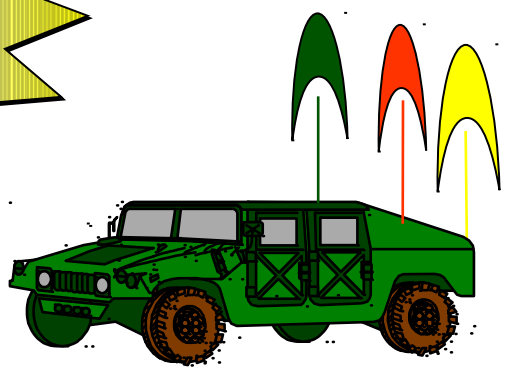




SWITCH/
CONTROLLER



- MATCHING NETWORK PROVIDES SUBBAND FILTERING
- PIN DIODE SWITCHING
- INCREASED GAIN & SELECTIVTY



Essential In Peace, Indispensable in War

Advanced Antennas STO
30-450 MHz Band Switched Antenna

DEFINITION

Development of a Multiband (30-450 MHz) Band Switched Antenna to reduce the susceptibility of a JTRS radio channel to cosite interference (e.g., reducing unwanted interference energy, received or transmitted).

Capability to reject non-desired, out-of-band interference signals during reception and reduce transmitted broadband noise is achieved by dividing the antenna's matching network into several frequency selective channels (# TBD). RF signals are routed through the selective channels by JTRS digital control signal.

This technology is expected to provide greater cosite immunity resulting in more robust communications links and extended ranges.

Advanced Antennas STO
30-450 MHz Band Switched Antenna

CHARACTERISTICS

- Frequency Range: 30-450 MHz
- Inputs: RF and JTRS Control Input
- RF Input Power: 50 Watts
- Form Factor: 3 meter center-fed whip
- Ancillaries: Separate 28 Vdc Control Box
- Selectivity: 12 dB @ 10% frequency offset
- Environmental: Meet vibration / temperature
- Control Word: IAW JTRS Cluster I ICD

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Advanced Antennas STO
30-450 MHz Band Switched Antenna

STATUS/PROGRAM DIRECTION

- Funding is available during FY04/05
- Single contract award is anticipated
- Period of Performance: 16 Months
- Two Band Switched Antenna prototypes, including all RF and Digital Control signal cabling, 28 Vdc DC power supply interfaces
- Prototypes will be evaluated 2QFY05 at the Electronic Proving Grounds, Ft Huachuca, AZ

Advanced Antennas STO
30-450 MHz Band Switched Antenna

CHALLENGES

- Preventing DC power supply noise coupling onto RF
- Heat Removal
- Reducing size of antenna matching base incorporating frequency selective filters
- Meeting selectivity requirements
- Reducing passband insertion losses

Advanced Antennas STO
30-450 MHz Band Switched Antenna

- **OBJECTIVE:** Develop a ground On-the-Move band switched antenna covering the 30 to 450 MHz frequency range. The antenna will be electronically tuned IAW Joint Tactical Radio tune commands thus providing the bandwidth, gain and interference rejection required for Objective Force and JTRS.
- **CONTRACT TYPE:** Cost Plus
- **ESTIMATED VALUE:** $400-600 K; 16 month effort
- **KEY MILESTONES:**
  - BAA/RFP Released: 4Q FY03
  - Contract Award: 2Q FY04
  - Prototypes Delivered: 3Q FY05
- **TECHNICAL CONTACT:** Ms. Yoram Levy (732) 427-4664
- **ACQUISITION CONTACT:** Ms. Virginia Knight (732) 532-4348
- **SOLICITATION RFP#:** TBD

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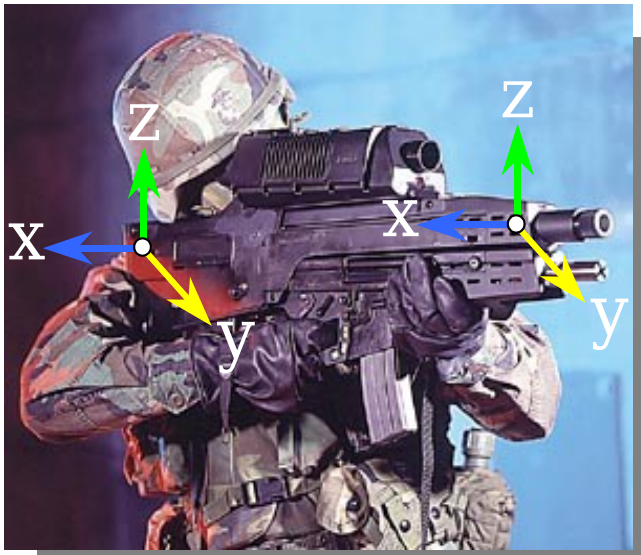
Advanced Pos/Nav and Tracking for the Objective Force



"Engaging enemy forces…at times and places of our choosing. Commanders will accomplish this…using common situational dominance"

US ARMY, Objective Force White Paper

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Advanced Pos/Nav and Tracking for the Objective Force

DESCRIPTION

To develop positioning, navigation and tracking sensor/integration technologies in support of operational and training requirements for mounted and dismounted warfighters. Advanced Pos/Nav and Tracking will provide robust and accurate Position, Velocity and Time (PVT) information for the Objective Force.

Advanced Pos/Nav and Tracking for the Objective Force

CHARACTERISTICS

- Operate in all environments (building interiors, urban and subterranean locations and under dense foliage).
- Technologies being pursued:
  - Network Assisted GPS
  - RF Ranging via SLICE
  - MEMS Inertial Integration with GPS
  - Sophisticated Integration Technologies.

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Advanced Pos/Nav and Tracking for the Objective Force

PROGRAM STATUS/PROGRAM DIRECTION

- The Program is a Joint CERDEC/STRICOM Science and Technology Objective (STO).
- Initiated in FY ’03 concluding in FY’06
- Program is closely coupled with the Objective Force Warrior and the Blue Force Awareness Protection Suite

Advanced Pos/Nav and Tracking for the Objective Force

CHALLENGES

- Robust and accurate position, velocity and time (PVT) information in urban/occluded and other degraded signal environments.
- Integration of multiple sensors.
- Size, weight, power and cost.
- Replace the current training scoring system (MILES-AGES)

Advanced Pos/Nav and Tracking for the Objective Force

- **OBJECTIVE:** Provide warfighters an affordable, reliable and accurate source of position, orientation and movement info to supports operations in urban and other complex environments.
- **CONTRACT TYPE:** Time and Materials delivery order on the R2CSR Omnibus.
- **ESTIMATED VALUE:** Approximately $500k
- **KEY MILESTONES:** Demonstration of a robust pos/nav capability in ’06
- **TECHNICAL CONTACT:** Mr. Paul Olson, (732) 427-3912
- **ACQUISITION CONTACT:** R2CSR Omnibus

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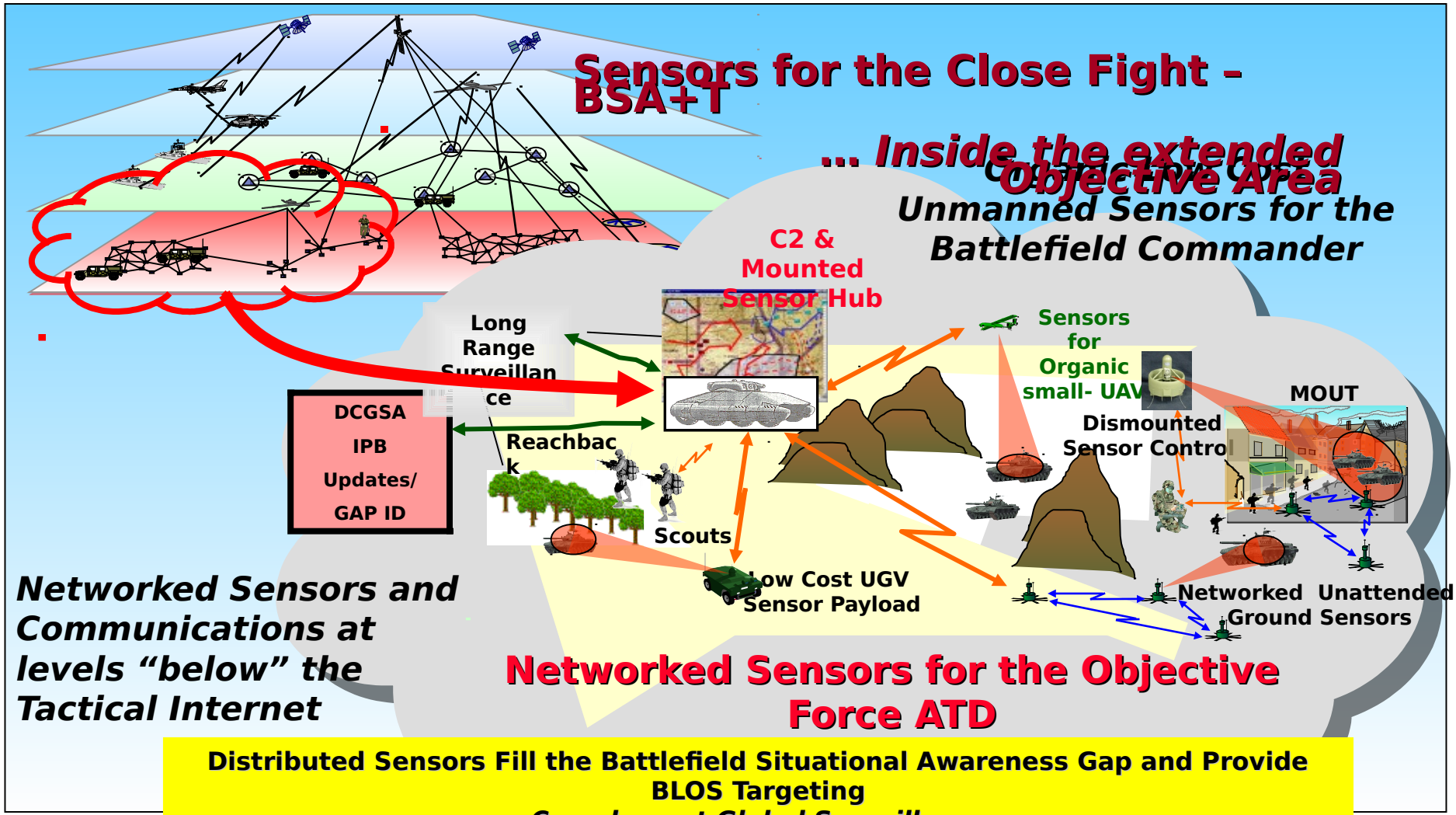
Networked Sensors for the Objective Force ATD – Command & Control


Sensors for the Close Fight – BSA+T
... Inside the extended Objective Area
Unmanned Sensors for the Battlefield Commander
C2 & Mounted Sensor Hub
Long Range Surveillance
DCGSA IPB Updates/ GAP ID
Reachback
Scouts
Low Cost UGV Sensor Payload
Sensors for Organic small- UAV
Dismounted Sensor Control
MOUT
Networked Unattended Ground Sensors
Networked Sensors and Communications at levels "below" the Tactical Internet
Networked Sensors for the Objective Force ATD

Distributed Sensors Fill the Battlefield Situational Awareness Gap and Provide BLOS Targeting

– Complement Global Surveillance –

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Networked Sensors for the Objective Force ATD – Command & Control

DESCRIPTION

Develop, integrate and demonstrate lower echelon Command & Control capabilities to dynamically plan and replan in near-real time, the allocation, management and control of multiple sensor assets. Intended to support mission planning, execution monitoring and replanning.

Networked Sensors for the Objective Force ATD – Command & Control

CHARACTERISTICS

- **RDEC Multi-directorate ATD**
  - NVESD – Sensor systems
  - S&TCD & ARL – Communications
  - I2WD – Correlation of sensed information
  - C2D – Command & control of sensors and platforms
  - ARL & ARDEC

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Networked Sensors for the Objective Force ATD – Command & Control

PROGRAM STATUS/PROGRAM DIRECTION

FY04:

- Leverage and enhance C2 software products from Agile Cdr ATD/C4ISR Testbed
  - Mission planning, monitoring, rehearsal, execution, and visualization
- Develop software modules specific to the ATD at the C2/RSTA Hub level for:
  - Sensor planning, placement, and management
  - Dynamic re-planning of sensor assets
  - Information management

Networked Sensors for the Objective Force ATD – Command & Control

PROGRAM STATUS/PROGRAM DIRECTION

(Continued)

- Integrate and embed C2/RSTA Hub level target correlation and deconfliction module for the UGS, UAVs and UGVs
- Program goal is to demo the planning, placement and control of three Small Unmanned Arial Vehicles (SUAV), three Unmanned Ground Vehicles (UGV) and 20 Unattended Ground Sensors (UGS) clusters per hub with four operators

Networked Sensors for the Objective Force ATD – Command & Control

CHALLENGES

- Planning placement/deployment of sensors and platforms based on environmental impacts (terrain, weather, wind direction/speed, etc.) and characteristics of platforms, communications and sensor systems
- Optimizing sensor resources to support mission: balance resources vs requirements of prioritized tasks
- Dynamic sensors & platforms planning and tasking / re-tasking (UGS, UAV, UGV)
- Management of correlated sensor information

Networked Sensors for the Objective Force ATD – Command & Control

- **OBJECTIVE:** Design, develop,integrate and demonstrate lower echelon System of Systems C2 capabilities that will enable the commander of a unit cell to plan the resource allocation, manage, and control multiple sensor assets in the execution of dynamic maneuver and targeting operations
- **CONTRACT TYPE:**
- **ESTIMATED VALUE:** FY04 **-** $6M, FY05 - $4M
- **KEY MILESTONES:**
  - Extending current effort under Agile Cdr ATD
  - White papers/BAAs – FY04
- **TECHNICAL CONTACT:** Mr. Vy Pham, (732) 427-4033
- **ACQUISITION CONTACT:** TBD
- **SOLICITATION # or RFQ #:** TBD

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Commander Driven Execution On-The-Move

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Commander Driven Execution On-The-Move

DESCRIPTION

Provide automated and predictive mission execution decision aids and on demand collaboration for on the move operations with primary focus for the Unit of Employment commanders and can be expanded down to the Unit of Action.

Commander Driven Execution On-The-Move

CHARACTERISTICS

- Robust, interactive decision tools for the Commander.
- Effective on-the-move collaboration tools.
- Compatible with legacy, interim, joint and coalition C4 systems.

Commander Driven Execution On-The-Move

PROGRAM STATUS/PROGRAM DIRECTION

- Proposed Science and Technology Objective (STO)
- FY04 – FY08
- Technology Readiness Level (TRL) 6 in FY08
- Transition to FCS Increment II_

Commander Driven Execution On-The-Move

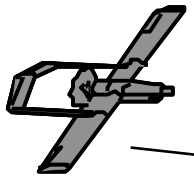
CHALLENGES

- Decision support tools that include data reasoning capabilities are not automated or mature.
- On demand collaboration tools are not yet mature enough to facilitate effective on-the-move collaboration for the commander.

Commander Driven Execution On-The-Move

- **OBJECTIVE:** Develop/demonstrate robust, automated, interactive and configurable decision aids with on demand collaboration for the Unit of Employment level commander.
- **CONTRACT TYPE:** Level of Effort
- **ESTIMATED VALUE:** FY05 - $4M, FY06 - $10M, FY07 - $4M, FY08 - $4M
- **KEY MILESTONES:** TBD
- **TECHNICAL CONTACT:** Mr. Eric Goodman, (732) 427-6588
- **ACQUISITION CONTACT:** TBD
- **SOLICITATION # or RFQ #:** TBD

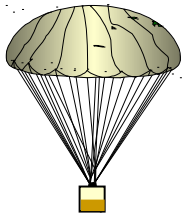
Objective Force Sustainment Planning and Execution Tools
(Proposed New)



OF Weapon/Sensor Platforms

Real Time Log Status Data

Tactical Decision Support Tools for Sustainment Planning and Execution



OF CSS Resources

Asset Visibility

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Objective Force Sustainment Planning and Execution Tools
(Proposed New)

DESCRIPTION

Effort will provide the research, development, demonstration and transition of Decision Support Tools for Combat Service Support Planning and Execution that help realize a “right sized” logistic footprint for the Objective Force and enable an increased operational tempo. The Software Tools will provide automation for mission sustainment demand forecasting, tactical supply distribution optimization, and predicted combat power visualization

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Objective Force Sustainment Planning and Execution Tools
(Proposed New)

CHARACTERISTICS

- Predictive consumption models for Objective Force logistic platforms that are a function of platform properties, mission specifics, and environmental conditions.
- Modeling of Objective Force tactical supply behaviors
- Army tactical supply chain optimization decision logic
- Exploit Real Time Platform Log Status data and Total Asset Visibility data for readiness and supply mission assessment (comparing current situation to plan). Exception data will be pushed to decision support tools in order to refine demand forecasts and/or adapt supply plans.

Objective Force Sustainment Planning and Execution Tools
(Proposed New)

PROGRAM STATUS/PROGRAM DIRECTION

- Proposed New Science and Technology Objective (FY04 through FY07)
- In FY04 conduct concept study and requirements analysis
- In FY05 develop predictive consumption models for OF platforms
- In FY06 demonstrate dynamic sustainment forecasting tool that exploits real time log status data
- In FY07 demonstrate tactical sustainment distribution management tools.

Objective Force Sustainment Planning and Execution Tools
(Proposed New)

CHALLENGES

- Accurately predicting “in-time” mission sustainment requirements
- Automatic refinement of log demand forecasts during execution
- Dynamic optimization of supply distribution as conditions change
- Limited tactical Bandwidth for low level CSS data

Objective Force Sustainment Planning and Execution Tools
(Proposed New)

- **OBJECTIVE:** Provide the Objective Force decision-maker with automated sustainment planning and execution tools.
- **CONTRACT TYPE: TBD**
- **ESTIMATED VALUE:** $.250M/FY04, $1.0M/FY05, $3.4M/FY06, $4.0M/FY07
- **KEY MILESTONES:** Analysis and Concept Study contract(s) awarded FY04. SW Design and Implementation contract(s) FY05.
- **TECHNICAL CONTACT:** Mr. Ken Beam, (732) 427-2720
- **ACQUISITION CONTACT:** TBD
- **SOLICITATION # or RFQ #:** TBD

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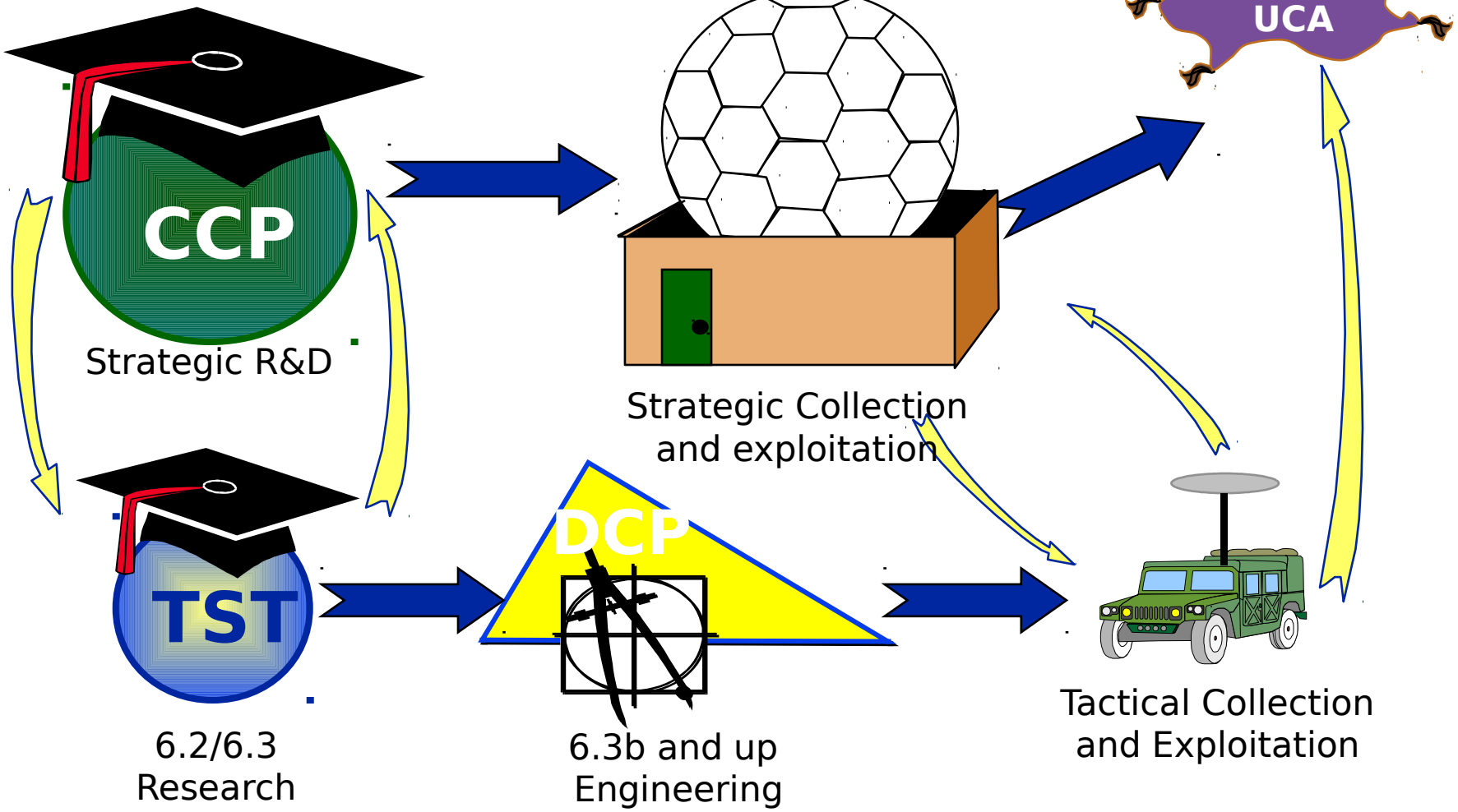
Tactical SIGINT Technology



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Tactical SIGINT Technology

DEFINITION

The TST Program is a process used by the three services, the marines and NSA, to leverage, mature and transition emerging technologies and other laboratory research into 6.3 research programs, products and capabilities such as STOs, ATDs and ACTDs in support of the intelligence community.

Tactical SIGINT Technology

CHARACTERISTICS

- TST is the Research and Development (6.2) Portion of the DCP (Defense Cryptologic Program) Effort providing applied research and non-system-specific R&D in support of the tactical warfighter where
  - No known solution exists
  - Existing solutions are inadequate/require improvement
- The US Army CECOM RDEC I2WD executes the Army portion of the TST program
  - Project selection and funding are made on a competitive basis.
  - Clear connection to warfighter and SIGINT system requirements is mandatory for a project to be selected.
- Successful developments transition to DCP 6.3b program

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Tactical SIGINT Technology

PROGRAM STATUS/PROGRAM DIRECTION

- 3 to 6 new TSTs started each fiscal year
- Almost all programs are three years in length (annual cost <$500K per year)
- All programs have a deliverable (software, algorithms, hardware)
- Can range from UNCLASSIFIED to SI/TK
- Can be inter-service (Navy, Air Force, NSA)
- The middle word in TST is SIGINT (the project MUST address a present or future SIGINT need)

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Tactical SIGINT Technology

CHALLENGES

Balanced investment strategy across challenges in BW, dynamic range, sensitivity, co-channel interference mitigation, and other on-board processing to enable required capabilities for all collectors (EBC, EAC, national/strategic) against any tasked signal

Tactical SIGINT Technology

- **OBJECTIVE:** Applied research and non-system-specific R&D in collection and exploitation systems as well as payloads
- **CONTRACT TYPE:** Small Business Innovative Research (SBIRs), Cost Plus-Fixed Fee (CPFF) using I2WD Broad Agency Announcement (BAA)
- **ESTIMATED VALUE:** $5-10M
- **KEY MILESTONES:**
  - **4QFY(X-2) -** customer needs assessment/update; I2WD internal and customer peer review
  - **1QFY(X-1) -** FY(X) proposals due at NSA
  - **2QFY(X-1) -** TRP peer review
  - **2-3QFY(X-1) -** TRP voting and project approval
- **TECHNICAL CONTACT:** Mr. Ernest Potenziani, (732) 427-3628
- **ACQUISITION CONTACT:** TBD
- **SOLICITATION # or RFQ #:** DAAB07-00-R-K501 (I2 BAA) and others

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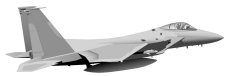
Coalition Combat Identification



Close Air Support

BLOS

Attack/Scout Helicopter

RBCI

FAC

RBCI

RBCI

BTID

Vehicle to Vehicle

RBCI

FO

Fire Support

DSID

Dismounted Infantry

BTID – Battlefield Target ID Device
RBCI – Radio Based Combat ID
DSID – Dismounted Soldier ID Device

Essen n War

Coalition Combat Identification

DEFINITION

Program to demonstrate Combat Identification (CID) systems for ground-to-ground (vehicle and soldier) and air-to-ground (helicopter, FAC and Fire support) mission areas for Joint, Allied and Coalition operations.

Characteristics

Radio Based Combat ID (RBCI)

- Low Cost Combat ID Solution for Air-to-Ground and Fire Support
- Software-only change to Combat Net Radio; no added hardware required
- Utilization in Legacy SINCGARS radios as well as transition to Joint Tactical Radio System (JTRS) for Future Combat Systems (FCS) applications (SINCGARS and Wideband Networking Waveform (WNW))
- Supports Joint/Allied Interoperability.

Battlefield Target ID Device (BTID)

- BTID provides NATO compliant millimeter wave (mmW) Fratricide solution
  - Field tested proven technology
  - Meets NATO Standard
  - Real time point-of-engagement target ID
- Provides BTID equipped vehicles with rapid, accurate NATO Interoperable Identification and mature technology for future mmW Combat ID applications.

Dismounted Soldier Identification Device (DSID)

- Laser interrogation with RF reply Question and Answer system

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Status

- **RBCI**
  - Demonstrated at Ft. Stewart's ASCIET(99&00)
  - Demonstrate on:
    - Helicopters (Apache)
    - Forward Air Controller (FAC)
    - Fire Support Team (FiST)
- **BTID**
  - Prototypes were successfully tested in an operationally representative environment.
  - Coalition testing of BTID in UK to occur in the Fall of 2003 with UK, France and US participating.
  - Planned for FCS Increment I
- **DSID**
  - Military Utility Assessment of Laser/RF technology in urban environment (Sept. 2003)
  - Developing coalition Standard Operating Procedures, Concept of Operations and Tactics, and Procedures for Dismounted Soldier ID
  - Developing NATO standards for DSID

Coalition Combat Identification

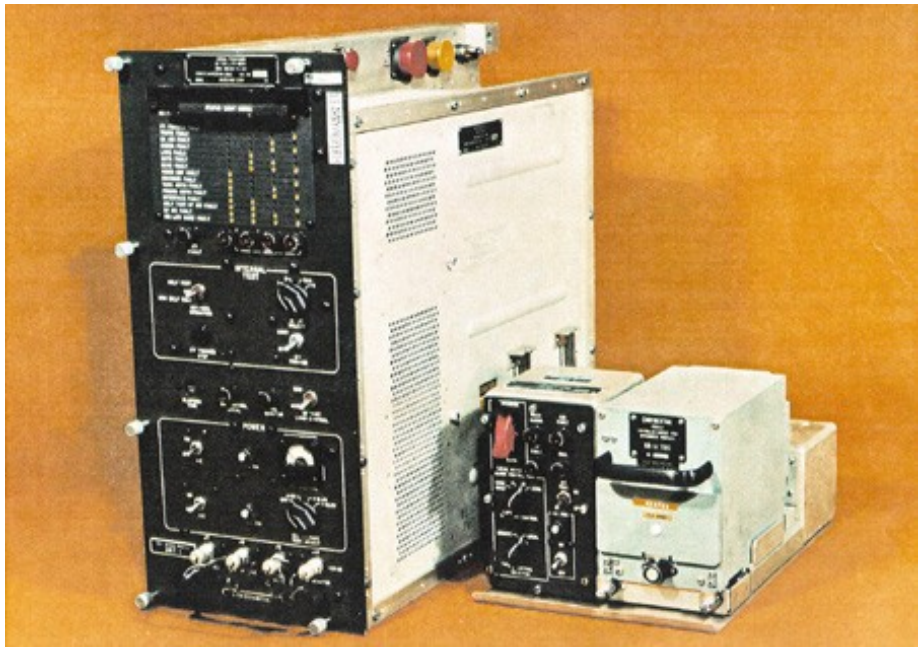
CHALLENGES

Developing affordable solutions for all mission areas within the size, weight, and operator constraints for each platform

Coalition Combat Identification

- **OBJECTIVE:**
  - Radio Based CI software for programmable radios
  - Affordable production of BTID
  - CID for fixed wing CAS
- **CONTRACT TYPE:** FFP & CPFF
- **ESTIMATED VALUE:** $580M
- **KEY MILESTONES:** Upon successful completion of the testing of the R&D efforts, the programs will go into production
- **TECHNICAL CONTACT:** Mr. Pete Glikerdas, (732) 427-5366
- **ACQUISITION CONTACT:** TBD
- **SOLICITATION # or RFQ #:** TBD

PATRIOT IFF



AN/TPX-46A(V)7

- 1970s technology
- Out of production
- Not feasible to upgrade
- 95# (RT and control unit)
- 12# (KIR-1C)
- 21.5” X 22.12” X 9.75” (RT)
- 8.12” X 16.0” X 10.0” (control unit)

Essential In Peace, Indispensable in War

PATRIOT IFF

DEFINITION

Selected upgrade to replace the AN/TPX-46A(V)7 Mark XII Identification Friend or Foe (IFF) Interrogator Set with a new Mark XIIA Air Defense Interrogator that will include new military crypto secure Mode 5 and civil Mode S.

Maximum commonality is required with new designs for all Air Defense Interrogator Sets.

PATRIOT IFF

CHARACTERISTICS

- Modular design for maximum commonality across Air Defense platforms
  - Existing platforms: PATRIOT, SENTINEL, ATNAVICS, MANPAD, AVENGER and LINEBACKER
  - Future platforms: JLENS and MEADS
- Mode 5 Level 1 and Level 2 capability
- Mode S Level 2 capability
- Retain existing Mode 1, 2, 3/A and 4 operation
- Utilize existing PATRIOT electrical interface until future radar processor upgrade
- Design for minimum integration impact to platforms

Essential In Peace, Indispensable in War

PATRIOT IFF

STATUS/PROGRAM DIRECTION

- Contract award scheduled for August 2003
- System Development and Demonstration Phase
  - PATRIOT: FY03 - FY05
  - Other platforms: FY05 - FY07 (options)
- Production Phase
  - PATRIOT: FY06 - FY07 (options)
  - Other platforms (except SHORAD Weapons): FY08 - FY010 (options)
- Time and Material provision for engineering services and repairs

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PATRIOT IFF

CHALLENGES

- Diversity of Air Defense platforms makes commonality requirement more difficult
- Requirement to utilize existing PATRIOT electrical interface will limit Mode 5 and Mode S capability for that platform until the interface is upgraded in the future

PATRIOT IFF

- **OBJECTIVE:** Develop common Air Defense Interrogator for initial use on PATRIOT
- **CONTRACT TYPE:** Cost Plus Fixed Fee development and Firm Fixed Price production options
- **ESTIMATED VALUE:** $94.7M including all platform development and production options
- **KEY MILESTONES:**
  - **Solicitation Release:** April 2003
  - **Contract Award:** August 2003
  - **PATRIOT SDD:** FY04 - FY06
  - **PATRIOT Production:** FY07 - Y08
- **TECHNICAL CONTACT:** Mr. Steven Haught, (732) 427-2750
- **ACQUISITION CONTACT:** Mr. Charm Yeung, (732) 427-1338
- **SOLICITATION # or RFQ #:** DAAB07-03-R-L574

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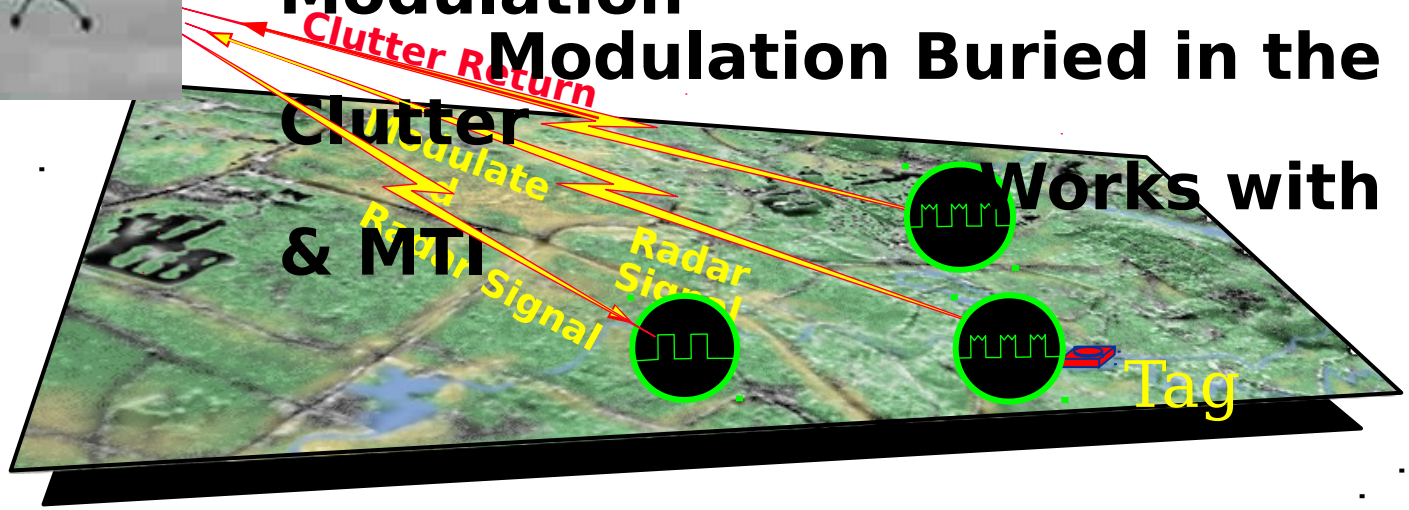
RF Tags System Concept

Information Embedded in Signal Modulation

Modulation Buried in the Clutter

Works with SAR & MTI



SAR Image

Tag Image

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RF Tags

DEFINITION

RF Tags are small, low-cost transceivers that detect radar signals, modify them, and transmit back to the radar. A short message text is embedded in the radar return. The message text includes, as a minimum, tag ID and GPS location. RF Tags are a Blue Force Tracking (BFT) device with air to ground combat ID capabilities.

RF Tags

CHARACTERISTICS

- Air (radar) to Ground (vehicles) Application
- Extraction of Tag Data from Signal Waveform in Real Time
- Low cost (less than $2k/tag)
- Low Power
  - Utilizes both vehicle and battery power
- Small RF tag mounted on top of vehicles
- Dual Band (Ku and X)
- Low Prob. Of Intercept (LPI)/Low Prob. Of Detection (LPD)
- Identify and Locate Blue Force and Coalition Forces
- Lowers probability of Fratricide
- Provides Situational Awareness

Situational Awareness, Indispensable in War

RF Tags

STATUS/PROGRAM DIRECTION

- Early 4QFY03 contract award to General Atomics under BAA 12 month effort
  - 10 month effort
  - Design, develop, and test 10 prototype dual band analog tags
  - Dual Band analog tags will be integrated onto moving and stationary vehicles at Ft. Dix, NJ during May 04.
  - Lynx radar with RF Tag extraction software integrated will participate in FY04 Ft. Dix Demo
  - Demonstrate military utility of RF tags operating with operational radar
- Transition to PEO IEW&S/CT3 FY05 for SDD Phase

RF Tags

CHALLENGES

- Lack of funding
- Developing Blue Force Tracking architecture
- Modifying military airborne Radars
- Ground Vehicle integration
- Developing signal algorithm

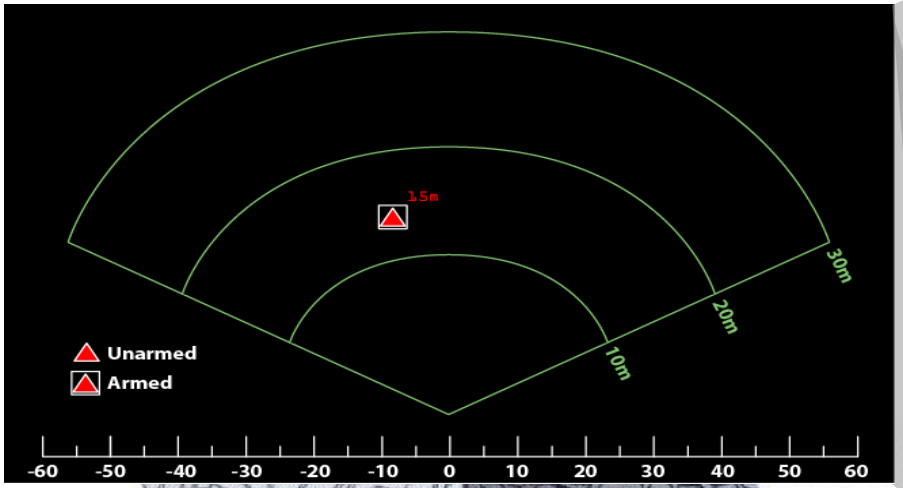
Essential In Peace, Indispensable in War

RF Tags

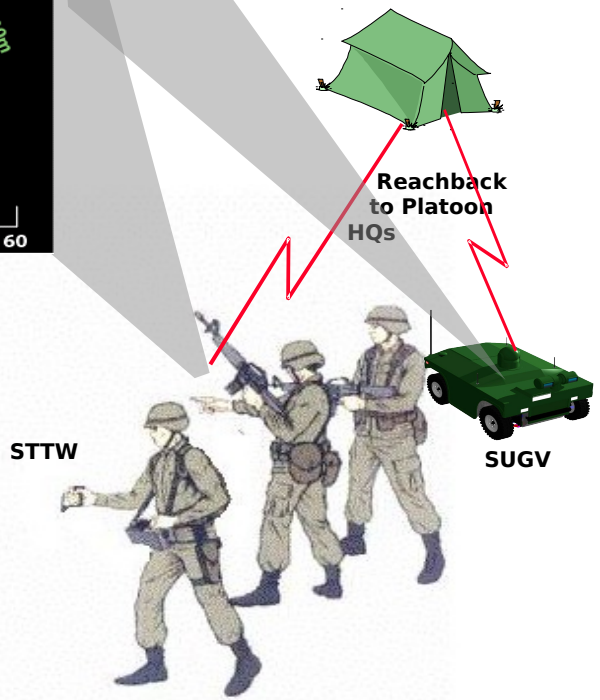
- **OBJECTIVE:** Develop, test, and demonstrate low cost, dual band Digital RF tags.
- **CONTRACT TYPE:** CPFF
- **ESTIMATED VALUE:** $ 7.0M
- **KEY MILESTONES:**

  Delivery of 10 prototype tags in 12 months
- **TECHNICAL CONTACT:** Ms. Lorraine Kohler, (732) 427-2143
- **ACQUISITION CONTACT:** TBD
- **SOLICITATION # or RFQ #:** TBD

Suite of Sense Through The Wall (STTW) Systems STO



Conceptual PDA Display



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Suite of Sense Through The Wall (STTW) Systems STO

DEFINITION

The Suite of Sense Through the Wall (STTW) systems will explore several technologies to provide mounted/dismounted users with the capability to detect, locate, and “see” personnel with concealed weapons and explosives who are hidden behind walls, doors and other visible obstructions.

Suite of Sense Through The Wall (STTW) Systems STO

CHARACTERISTICS

- Near Real Time Situation Awareness Information
- Increase system standoff distance without sacrificing Probability of Detection
- Geolocation of multiple targets
- Detection of multiple targets with a high Probability of Detection in the presence of clutter
- Concealed Weapons (CW)/Concealed Explosives (CE) detection from a standoff distance and high Probability of Detection
- Soldier borne/Small Unmanned Ground Vehicle (SUGV) mounted /Armed Robotic Vehicle (ARV) mounted

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Suite of Sense Through The Wall (STTW) Systems STO

STATUS/PROGRAM DIRECTION

- STO begins in FY04
- Multiple contract awards scheduled for FY04
- Delivery of limited capability prototypes in FY06 and more robust prototypes in FY08
- Transition of hand held system to PEO Soldier in FY06 and FY08
- Transition of Small Unmanned Ground Vehicle (SUGV) and Armed Robotics Vehicles (ARV) mounted system to PM Robotics and Unmanned Sensors (PM RUS) in FY06 and FY08

Suite of Sense Through The Wall (STTW) Systems STO

CHALLENGES

- Present systems unable to achieve desired stand off distance/Probability of Detection
- Performance of prototype STTW systems limited by dense walls
- Graphical User Interfaces (GUIs) are not user friendly and do not provide target geo-location data
- Prototypes must be stationary in order for them to take measurements
- Prototypes cannot detect non-moving targets and individuals with concealed weapons and concealed explosives

Essential In Peace, Indispensable in War

Suite of Sense Through The Wall (STTW) Systems STO

- **OBJECTIVE:** Achieve a Technology Readiness Level 6 for Suite of Sense Through The Wall systems
- **CONTRACT TYPE:** Cost Plus Fixed Fee (CPFF)
- **ESTIMATED VALUE:** ~$25 million
- **KEY MILESTONES:**
  - Multiple Awards FY04
  - Handheld/Small Unmanned Ground Vehicle (SUGV) through wall personnel detection prototype delivery FY06
  - Armed Robotic Vehicle (ARV) with concealed weapons (CW)/ concealed explosives (CE) & personnel detection prototypes delivery FY06
  - Handheld/SUGV/ARV with concealed weapons (CW)/concealed explosives (CE) & personnel detection through wall prototypes delivery FY08
- **TECHNICAL CONTACTS:**
  - Mr. Wilbur Chin, (732)532-8725
  - Mr. Mark Farwell, (732)532-3052
- **ACQUISITION CONTACT:** TBD
- **SOLICITATION # or RFQ #:** DAAB07-00-R-K501

Essential In Peace, Indispensable in War

C4ISR SCIENCE AND TECHNOLOG

- *SUPPORTING TODAY'S WARFIGHTERS*
- *SUPPORTING TOMORROW'S TRANSFORM*

CERDEC AND INDUSTRY WILL MEET THE CHALLENGE

Click here to return to Table of Contents